

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/808,781	OLIVEIRA ET AL.	
	<b>Examiner</b>	Art Unit	

Sathyaranayan Pannala  
2164

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

- This communication is responsive to 1/8/2009.
- The allowed claim(s) is/are 1,4-15,17-23,25-27 and 32-34 (renumbered as 1-26).
- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - All
  - Some\*
  - None
 of the:
  - Certified copies of the priority documents have been received.
  - Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 \* Certified copies not received: \_\_\_\_\_.
- A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
- CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
 Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
- DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- Notice of References Cited (PTO-892)
- Notice of Draftsperson's Patent Drawing Review (PTO-948)
- Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
- Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
- Notice of Informal Patent Application
- Interview Summary (PTO-413),  
Paper No./Mail Date attached.
- Examiner's Amendment/Comment
- Examiner's Statement of Reasons for Allowance
- Other \_\_\_\_\_.

/Sathyaranayan Pannala/  
Primary Examiner, Art Unit 2164

**DETAILED ACTION**

1. Applicant's request for Pre-Appeal Brief Review filed on 2/17/2009 and the panel decided to reopen the prosecution. Claims 1-27 and 32-34 are pending. After compact prosecution for allowance, pending claims are 1, 2-15, 17-23, 25-27 and 32-34.
  
2. Examiner called Applicant for compact prosecution to discuss the rejection of claims under 35 U.S.C. 101, 112, 1<sup>st</sup> paragraph and 103 under prior art. During the discussion Applicant agreed to amend claims as well as combining claims (for details, see Interview Summary).

**EXAMINER'S AMENDMENT**

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Donald W. Muirhead, Reg. No. 33,978 on 5/20/2009.

**Claims: Replace amended on record claims 1-27 and 32-34 with the following:**

1. (Currently amended) A computer-implemented method of handling writing new data, comprising:

creating a journal entry that points to a first storage location containing old data to be replaced by the new data, wherein the journal entry is maintained after writing the new data;

allocating new storage space having a second storage location; and writing the new data to the new storage space at the second storage location, wherein the old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location, wherein the journal entry pointing to the first storage location containing the old data provides a restoration previous state corresponding to the old data, wherein the restoration previous state is accessible after writing the new data, [[and]] wherein the new data and subsequent new data are kept from overwriting the old data corresponding to the journal entry, wherein the new storage space is provided by at least one storage device, and wherein allocating new storage space includes remapping a switch coupled to the at least one storage device.

2. (Cancelled)
3. (Cancelled)
4. (Currently amended) [[A]] The method, according to claim [[3]] 1, wherein the new data is written by a host coupled to the switch.

5. (Currently amended) [[A]] The method, according to claim 4, wherein the switch presents the host with a logical storage area that is created by the switch mapping to different locations of the at least one storage device.
6. (Currently amended) [[A]] The method, according to claim 5, wherein the mapping is transparent to the host.
7. (Currently amended) [[A]] The method, according to claim 4, wherein the switch includes at least one processor and a corresponding memory.
8. (Currently amended) [[A]] The method, according to claim 7, wherein the journal entry is part of a journal that is stored in the memory.
9. (Currently amended) [[A]] The method, according to claim 1, wherein the storage space corresponds to a disk array storage device.
10. (Currently amended) [[A]] The method, according to claim 9, wherein the journal entry is stored in the disk array storage device.
11. (Currently amended) [[A]] The method, according to claim 9, wherein the journal entry is stored outside the disk array storage device.

12. (Currently amended) [[A]] The method, according to claim 11, wherein allocating new storage space includes remapping a switch coupled to the disk array storage device and wherein the journal entry is stored on the switch.
13. (Currently amended) [[A]] The method, according to claim 1, wherein each of the journal entries also includes a time stamp.
14. (Currently amended) [[A]] The method, according to claim 1, wherein each of the journal entries also includes a result of writing the data.
15. (Currently amended) A computer-readable storage medium storing computer software, executable by a processor, that handles writing new data, the computer software stored on the computer-readable storage medium comprising:
  - executable code that creates a journal entry that points to a first storage location containing old data to be replaced by the new data, wherein the journal entry is maintained after writing the new data;
  - executable code that allocates new storage space having a second storage location; and
  - executable code that writes the new data to the new storage space at the second storage location, wherein the old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location, wherein the journal entry pointing to the first storage location

containing the old data provides a restoration previous state corresponding to the old data, wherein the restoration previous state is accessible after writing the new data, [[and]] wherein the new data and subsequent new data are kept from overwriting the old data corresponding to the journal entry, wherein the new storage space is provided by at least one storage device, and wherein the executable code that allocates new storage space remaps a switch coupled to the at least one storage device.

16. (Cancelled)

17. (Currently amended) The computer-readable storage medium, according to claim [[16]] 15, wherein the journal entry is stored on the switch.

18. (Currently amended) The computer-readable storage medium, according to claim [[16]] 15, wherein the journal entry is stored at a location other than the switch.

21. (Currently amended) A computer-implemented method of restoring data to a storage device, comprising:

accessing a journal having a plurality of entries, wherein each of the entries points to prior data that existed on the storage device before a write caused the entry to be created, wherein an entry in the journal is created for each data write to the storage device that occurred after an initial time, wherein the

prior data corresponding to each of the plurality of entries in the journal is maintained in the storage device after each new data write after the initial time, wherein each entry pointing to prior data provides a ~~restoration~~ previous state corresponding to the prior data, wherein the ~~restoration~~ previous state is accessible after writing the new data, and wherein the new data and subsequent new data are kept from overwriting the prior data corresponding to each entry; and

using at least one of the entries to remap the storage device to point to the prior data, wherein using at least one of the entries to remap the storage device includes changing a map of a switch coupled to the storage device.

22. (Currently amended) [[A]] The method, according to claim 21, wherein each of the journal entries includes a time stamp.

23. (Currently amended) [[A]] The method, according to claim 22, wherein using at least one of the entries to remap the storage device includes remapping the one of the entries having a most recent time stamp.

24. (Cancelled)

25. (Currently amended) [[A]] The method, according to claim [[24]] 21, wherein the storage device is a logical storage device presented by the switch and wherein

remapping includes modifying the relationship between the logical storage device and physical storage devices coupled to the switch.

26. (Currently amended) [[A]] The method, according to claim 25, wherein the physical storage devices are disk array storage devices.

27. (Currently amended) [[A]] The method, according to claim [[24]] 21, wherein accessing the journal includes accessing a memory of the switch.

32. (Currently amended) A computer-implemented journal used for continuous backup of a storage device, comprising:

    a first entry that points to a first storage location containing old data replaced by new data written to the storage device; and

    a plurality of additional entries that point to respective additional storage locations containing old data replaced by new data written to the storage device, wherein for every write to the storage device that occurs after an initial time, there is a corresponding entry, and wherein the old data corresponding to each of the plurality of additional entries is maintained in the storage device after each new write to the storage device after the initial time, wherein each of the entries pointing to the storage locations containing the old data provides a restoration previous state corresponding to the old data, wherein the restoration previous state is accessible after writing the new data, and wherein the new data and

subsequent new data are kept from overwriting the old data corresponding to each of the entries, wherein at least one of the entries remaps the storage device by changing a map of a switch coupled to the storage device.

33. (Currently amended) [[A]] The journal, according to claim 32, wherein each of the entries includes a time stamp.

34. (Currently amended) [[A]] The journal, according to claim 32, wherein each of the entries includes a result of writing the data.

#### ***Reasons for allowance***

4. The following is an examiner's statement of reasons for allowance:

- Prior art of record does not teach or suggest or render obvious the claimed limitations in combination with the specific added limitations as recited in independent claims 1, 15, 21 and 32. The prior art of record fails to teach or suggest in combination of claimed elements including "writing the new data to the new storage space at the second storage location, wherein the old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location, wherein the journal entry pointing to the first storage location containing the old data provides a previous state corresponding to the old data, wherein the previous state is accessible after writing the new data,

wherein the new data and subsequent new data are kept from overwriting the old data corresponding to the journal entry, wherein the new storage space is provided by at least one storage device, and wherein allocating new storage space includes remapping a switch coupled to the at least one storage device" as recited in independent claims 1, 15, 21 and 32.

- Nakatani (US Patent 7,047,355) teaches server with a storage system that efficiently write journal logs and execute flush processing. To implement this, the storage system that receives a journal log from the server uses updated data included in the journal log to execute flush processing. Akutsu et al. (US Patent 6,510,986) a technique wherein even if storage of electronic journal data into a storage medium fails, the storage of the journal data can be ensured. It also provides a technique which allows, while writing electronic journal data, reception of new electronic journal data so as to prevent stoppage of a transaction machine. Testardi (US Patent 7,013,379) teaches a data operation is routed to a fast path for processing if the data operation has the at least one predetermined criteria, and routing the data operation to a general control path for processing otherwise.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sathyanarayan Pannala whose telephone number is (571) 272-4115. The examiner can normally be reached on 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sathyanarayan Pannala/  
Primary Examiner, Art Unit 2164

srp  
May 21, 2009